Access to Voice mail w/i home n when roaming

A8

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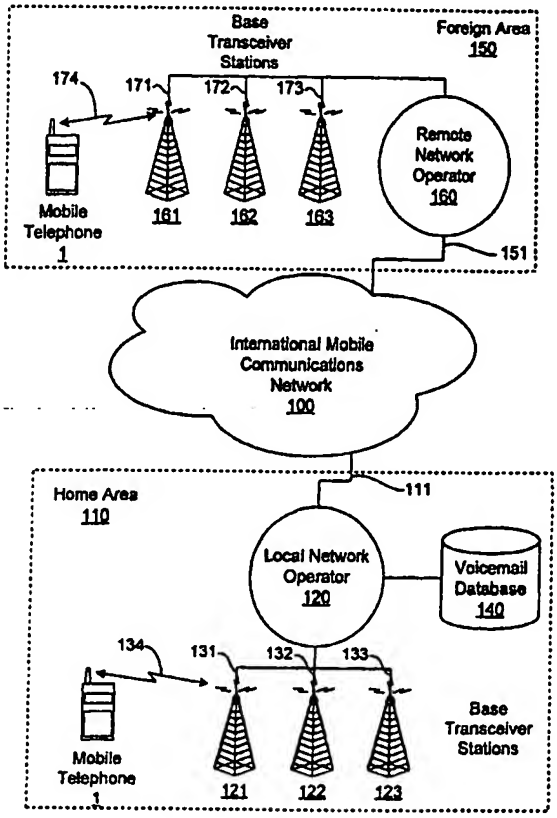

(57) Abstract: A portable communication apparatus (1) may be used for accessing a user service (140), such as voicemail, provided by a first network operator (120) in a multi-operator mobile communications network (100). The apparatus has a user interface involving a controller, a keypad and a memory. A first memory area of the memory stores a first number sequence to be used for requesting the user service directly from the first network operator. A second memory area of the memory stores a second number sequence to be used for requesting the user service indirectly from the first network operator through a second network operator (160). A single item of the user interface, preferably a specific key in the keypad, is used for requesting access to the user service. The controller determines whether the apparatus (1) is in direct operative contact with the first network operator, and if so, the first number sequence is submitted directly to this operator. Otherwise, in case the mobile telephone (1) is used in a roaming situation, where the telephone (1) is not in a direct operative contact with the first network operator but with the second operator, the second number sequence is submitted indirectly to the first network operator through the second network operator. An advantage is that a standardized interface is provided for requesting voicemail access; the same item is used irrespective of whether the telephone (1) is used in a roaming situation or not.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A PORTABLE COMMUNICATION APPARATUS AND A METHOD FOR THE OPERATION THEREOF

Technical Field

The present invention relates to a portable communication apparatus for use in a mobile communications network having at least a first network operator and a second network operator, which are both capable of providing access for the apparatus to the network, where the apparatus has a user interface involving a controller, an input device and a memory, and where the user interface has an option for allowing a user of the apparatus to access a user service (such as voicemail) provided by the first network operator.

The invention also relates to a method of providing access to a user service (such as voicemail), provided by a first network operator, for a user of a portable communication apparatus in a mobile communications network having multiple network operators.

Prior Art

Examples of portable communication apparatuses as set out above are for instance mobile or cellular telephones, wireless telephone handsets, personal communicators, portable digital assistants, palmtop computers, etc.

For the rest of this document, reference is made to a mobile telephone, which is chosen to represent a portable communication apparatus according to the invention. However, the invention shall in no way be limited to merely a mobile telephone.

Voicemail access is an important service for a user of a mobile telephone in a mobile communications network. In summary, a voicemail service allows a calling party to leave a spoken message, in case the user of the mobile telephone is not available for answering the incoming call. Later on, the user may access a voicemail account provided by a local network operator, at which the user has a mobile

telephone subscription, and listen to any messages addressed to him/her. In most mobile communications networks, as long as the user stays within a subarea of the network, where the local network operator is present, accessing a voicemail account is a very easy task. Normally, the user will enter a short number sequence, consisting of three or four digits, on a keypad of the telephone and press a confirmation key, such as "YES" or "OK". The short number sequence is submitted to the local network operator, which recognizes the meaning thereof and initiates the voicemail access. Furthermore, since the telephone number or Caller Line Identity (CLI) of the mobile telephone is available on the communication link between the mobile telephone and the local network operator, there is no need for the user to specifically enter his/her telephone number or any other information that identifies the voicemail account.

When, on the other hand, the user brings his/her mobile telephone abroad, the local network operator will typically not be able to handle the direct connection of the mobile telephone to the mobile communications network. Instead, most international communications networks (such as GSM) have functions which allow another network operator, called remote network operator in the following, to handle the direct connection between the mobile telephone and the mobile communications network. This feature is generally referred to as roaming. In roaming situations, the short number sequence mentioned above will typically not work for requesting access to voicemail services. The reason for this is that there is no standardized voicemail request sequence, which is common to all network operators. Instead, each individual network operator generally has its own number sequence for requesting voicemail access.

Therefore, in order to access a voicemail account held by the local network operator, a user which is

presently abroad will have to dial a specific telephone number to the local network operator and in addition enter a long number sequence comprising an identity of the user as well as an identity authorization code.

It is previously known to store such a long number sequence for remote access to voicemail in a telephone book of the mobile telephone. In this way, the user does not have to enter the long number sequence every time voicemail is to be accessed in situations of roaming. Nevertheless, the known solution has a drawback in that the user himself/herself has to remember or check whether roaming is taking place and in response thereof select the short number sequence or the long number sequence.

Summary of the Invention

The object of the present invention is to remedy the drawback above and provide a standardized, simplified and improved way of handling access to user services (such as voicemail) from a mobile telephone, which is operative in a international or multi-operator mobile communications network.

Generally speaking, this object is achieved by a portable communication apparatus, and a method of providing access to a user service from such an apparatus, according to the attached independent claims.

More specifically, according to a preferred embodiment, the object is achieved by storing, in memory, a first number sequence (short) to be used for accessing the user service (preferably voicemail) when the apparatus is operatively registered directly at the local network operator, and storing a second number sequence (longer) to be used for accessing the user service indirectly through another (remote) network operator, when roaming is taking place and the apparatus is currently not registered at the local network operator but with the remote network

operator. Moreover, an item in the user interface of the telephone, preferably a specific key in the keypad, is used for requesting access to the user service, and upon selection of this item by the user, a controller of the telephone will determine whether it is currently operatively registered at the local network operator and, if so, submit the first number sequence as a request for voicemail access to the local network operator. Otherwise, i.e. if the telephone operates in a roaming situation, the second number sequence will be submitted indirectly to the local network operator through the remote network operator.

Other purposes, features and advantages of the present invention will appear from the following detailed disclosure, from the attached drawings as well as from the dependent claims.

Brief Description of the Drawings

A preferred embodiment of the invention will now be described in more detail, reference being made to the accompanying drawings, in which

FIG 1 is a schematic front view of a portable communication apparatus, exemplified as a mobile telephone, having novel functionality for providing voicemail access according to the invention,

FIG 2 is a schematic block diagram of the main functional parts of the apparatus shown in FIG 1,

FIG 3 is a schematic block diagram illustrating the basic principle of how voicemail access is provided in an international mobile communications system, and

FIG 4 is a flow chart illustrating a method of providing voicemail access according to the invention.

Detailed Disclosure of a Preferred Embodiment

An example of a portable communication apparatus is given in FIG 1 in the form of a mobile telephone 1. The telephone has a housing 10, an antenna 2 mounted on top of the housing, a status indicator LED 3, a speaker 4, volume adjustment controls 5, an LCD display 6 and a keypad 7. The keypad 7 has a plurality of individual keys, such a YES button 12 and a NO button 13, arrow keys 14, 15, a clear key 16, numeric keys 17 (labelled "0" through "9"), a star key 18 and a hash key 19. One numeric key 17a (labelled "1" in FIG 1) has a special function for accessing voicemail, as will be described further below.

A foldable flip 8 is swingably mounted to the apparatus housing 10 by means of a hinge mechanism 11. The flip 8 comprises a sound opening 9, through which vocal sound is received from the user of the telephone and forwarded to an internal microphone (not shown in the drawing).

The basic components of the mobile telephone 1, within the context of the present invention, are shown in FIG 2. A controller 20 is operatively connected to an electronic memory 30 as well as to the display 6 and the keypad 7 shown in FIG 1. The controller 20 itself may be generally known per se and is typically implemented by a CPU, microprocessor or another programmable logic device. Likewise, the memory 30 may be implemented by any commercially available components, such as RAM memory circuits, EEPROM circuits, flash memory circuits, etc.

This far, the telephone 1 does not differ in any essential aspect from an arbitrarily chosen mobile telephone of the prior art. As a novel feature, on the other hand, the mobile telephone 1 provides improved functionality for simplified access to operator-based user services, such as voicemail, which will be disclosed in detail below.

According to the preferred embodiment, the telephone 1 is given a single-key voicemail access functionality by assigning a specific numeric key 17a (labelled "1") a special meaning, when depressed for a time period longer than a predetermined limit. When this happens, i.e. when the user applies such a long press on the key 17a, a voicemail access number sequence is automatically read from memory 30 by the controller 20 and is submitted to either the local network operator, if the telephone is located in its "home area", or a foreign network operator, for instance when the telephone 1 is brought abroad and roaming is used. As explained above, since the voicemail access number sequence is different (typically shorter) when the telephone 1 is directly connected to the local network operator than if roaming through a foreign network operator is used, the memory 30 is provided with two separate areas for storing the respective voicemail access number sequences.

In a real-world example, if the local network operator is the Swedish company Telia for a Swedish subscriber, then the short voicemail access number sequence (referred to as VMRequestLocal) might read "133". Correspondingly, the long voicemail access number sequence (VMRequestRemote), to be used when the telephone 1 is abroad, might be "+467061331330705123456 1234", where:

- "+46" is the international prefix for Sweden,
- "706133133" is a telephone number provided by Telia for accessing a voicemail account thereof,
- "0705123456" is the telephone number (Caller Line Identity) of the telephone, and
- "1234" is an identity authorization code associated with the voicemail account in question.

According to the preferred embodiment, the user interface of the mobile telephone 1 has a menu option for

allowing the user to specify both the short number sequence (VMRequestLocal) and the long number sequence (VMRequestRemote). Moreover, the user interface has an option for allowing the user to edit an already stored short or long number sequence.

FIG 3 is a schematic illustration of an international mobile communications network 100, in which a mobile telephone 1 is used for accessing voicemail services according to the invention. The mobile telephone 1, or more specifically the user or owner thereof, has a subscription at a local network operator 120, which is connected to the international mobile communications network 100 by a link 111. As part of the subscription, the local network operator 120 provides a voicemail account, which the user may access through his/her mobile telephone 1. The voicemail account as well as all messages left therein are stored in a voicemail database 140. Moreoever, in a generally known way, the local network operator 120 has a plurality of base transceiver stations 121, 122, 123, which are operatively connected to the operator through links 131, 132, 133.

Each base transceiver station serves a respective cellular area, within which mobile telephones, including the telephone 1, may be connected to the international mobile communications network 100 through radio signals 134. The geographic coverage of all base transceiver stations belonging to the local network operator 120 is called a home area 110 in FIG 3. Furthermore, other network operators than the local network operator 120 are connected to the international mobile communications network 100. For instance, a remote network operator 160 is connected through a link 151 to the network 100 and has a geographical coverage area, which is called a foreign area 150 in FIG 3. A plurality of base transceiver stations 161, 162, 163 are connected through respective links 171, 172, 173 to

the central parts of the remote network operator 160. Mobile telephones present within the foreign area 150 may be connected to the international mobile communications network 100 through wireless links 174.

In a normal situation, when the normal telephone 1 is used within its home area 110 and is in operative contact with the local network operator 120, voicemail may be accessed in the following way, with further reference to FIG 4. The controller 20 of the mobile telephone 1 is provided with a voicemail access routine 400, which in a step 410 checks whether the user has applied a long press on the key 17a (numeric key "1"), thereby initiating a request for voicemail access. If the answer is in the affirmative, the control is transferred to a step 420; otherwise the control is transferred back to the beginning of routine 400. In step 420, the controller 20 determines the name or identity of the network operator, which is currently serving the mobile telephone 1. A variable CurrentOperator is assigned this value. Consequently, assuming that the mobile telephone 1 resides within the home area 110, CurrentOperator will be assigned the identity of the local network operator 120 in step 420.

In a subsequent step 430 the controller 20 determines whether the variable CurrentOperator is equal to the identity of the local network operator 120, which is represented by a constant LocalOperator. Given the conditions above, the answer will be in the affirmative, and the control is continued to a step 440, where the short voicemail access number sequence VMRequestLocal is read from the first memory area of memory 30. Then, in a step 450, the number sequence VMRequestLocal is submitted to the local network operator 120, as identified by the variable CurrentOperator, and finally the control is transferred back to the beginning of the voicemail access routine 400, thereby forming an endless loop. The request for voicemail

access when the mobile telephone 1 resides within the home area 110 will be transmitted over the wireless link 134 to the nearest base transceiver station 121, across its associated link 131 to the central parts of the local network operator 120. A voicemail management system will be invoked at the local network operator 120, and the voicemail account belonging to the user of the mobile telephone 1, as identified by the Caller Line Identity thereof, will be accessed in the voicemail database 140. All messages therein, if any, which are directed at the particular user of the mobile telephone 1, will be presented vocally to the user of the mobile telephone 1, in a way which is well-known per se.

If, on the other hand, it is assumed that the mobile telephone 1 is brought to the foreign area 150, for instance to another country than the country in which the local network operator 120 and the home area 110 is located, the mobile telephone 1 will instead be in operative contact with the remote network operator 160 through the nearest base transceiver station 161. In such a case, the variable CurrentOperator as retrieved in step 420 will be assigned the name or identity of not the local network operator 120 but the remote network operator 160.

In step 430, the comparison between the variable CurrentOperator and the value of LocalOperator will be negative, and the control will be transferred to a subsequent step 460. In step 460, the long voicemail access number sequence VMRequestRemote will be read from the second memory area of memory 30, and in a step 470 this number sequence will be submitted to the remote network operator 160 through the wireless link 174 and the link 171.

As set out above, since the long voicemail access number sequence VMRequestRemote will preferably contain a telephone number belonging to the local network operator

120, the remote network operator 160 will redirect the call, through the link 151, across the international mobile communications network 100 to the local network operator 120 over the link 111.

The voicemail management system of the local network operator 120 will examine the long voicemail access number sequence VMRequestRemote and identify the telephone number or Caller Line Identity of the mobile telephone 1. The voicemail management system will also extract the identity authorization code at the end of the long voicemail access number sequence VMRequestRemote, and then all vocal messages associated with the voicemail account in question will be read from database 140, forwarded through the links 111 and 151 to the remote network operator 160 and transferred as an ordinary telephone call through the nearest base station 161 and the wireless link 174 to the user of the mobile telephone 1.

The invention has been described above with reference to a preferred embodiment. However, the present invention shall in no way be limited by the description above; the scope of the invention is best defined by the appended independent claims. Other embodiments than the particular ones described above are equally possible within the scope of the invention. For instance, even if the disclosure above is directed at accessing voicemail services, it is equally applicable to other user services, such as telefax messages, which are queued at the local network operator to be fetched and delivered to a particular telefax machine wherever and whenever the user wants.

CLAIMS

1. A method of providing access to a user service (140), provided by a first network operator (120), for a user of a portable communication apparatus (1) in a mobile communications network (100) having multiple network operators, **characterized by**

storing, in the portable communication apparatus (1), a first number sequence (VMRequestLocal) to be used for accessing said user service, when the apparatus is operatively registered at the first network operator;

storing, in the portable communication apparatus, a second number sequence (VMRequestRemote) to be used for accessing said user service, when the apparatus is operatively registered at another network operator (160) than the first network operator (120);

associating an item (17a) in a user interface (7) of the apparatus with a request for said user service;

upon selection of said item by the user, determining whether the apparatus is operatively registered a) at the first network operator or b) at another network operator;

if the answer is a), submitting the first number sequence to the first network operator, or otherwise;

submitting the second number sequence to said another network operator.

2. A method according to claim 1, wherein said user service involves reading voicemail messages.

3. A method according to claim 1, wherein said user service involves accessing fax messages.

4. A method according to any preceding claim, comprising a further step of providing an option in the user interface (7) for editing at least one of said first

and second number sequences (VMRequestLocal, VMRequestRemote).

5. A method according to any preceding claim, wherein said item (17a) in the user interface (7) is a predetermined key in a keypad.

6. A method according to any preceding claim, wherein the apparatus is a mobile telephone (1).

7. A portable communication apparatus (1) for use in a mobile communications network (100) having at least a first network operator (120) and a second network operator (160), both of which are capable of providing access for the apparatus to the network, the apparatus having a user interface involving a controller (20), an input device (7) and a memory (30), wherein the user interface has an option (17a) for allowing a user of the apparatus to access a user service (140) provided by the first network operator, **characterized by**

a first memory area of said memory (30) adapted to store a first number sequence (VMRequestLocal) for submitting a request for said user service (140) directly to the first network operator (120), and

a second memory area of said memory (30) adapted to store a second number sequence (VMRequestRemote) for submitting a request for said user service indirectly to the first network operator through the second network operator (160),

wherein the controller (20) is adapted to determine, upon selection of said option (17a) by the user, whether the apparatus (1) is in direct operative contact with the first network operator and, if so, submit the first number sequence stored in memory (30) directly to the first network operator, and wherein the controller (20) is

otherwise adapted to submit the second number sequence stored in memory (30) indirectly to the first network operator through the second network operator.

8. An apparatus as in claim 7, wherein the input device (7) comprises a keypad and wherein the user interface is adapted to recognize the selection of said option by detecting when a predetermined key (17a) of said keypad is held depressed during a predetermined minimum time period.

9. An apparatus as in claim 7 or 8, wherein the apparatus is a mobile telephone (1).

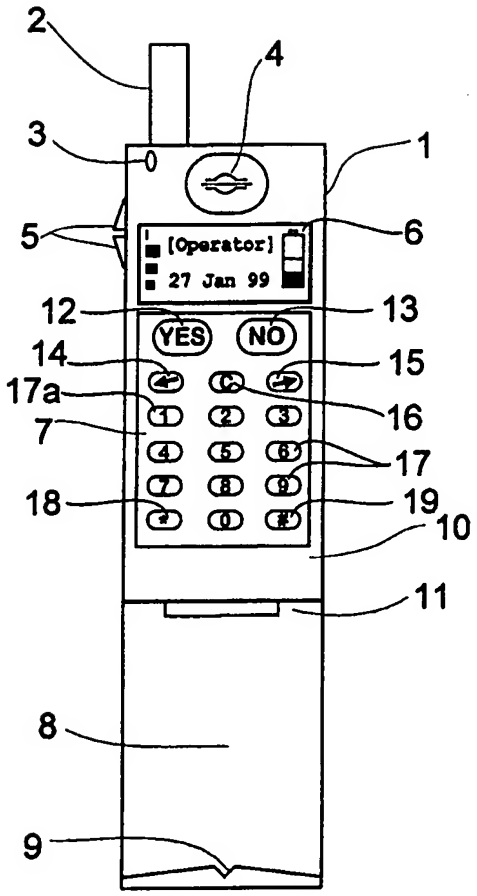

2
4
3
1
5
6
[Operator]
27 Jan 99
12
13
YES
NO
14
15
17a
16
7
17
18
19
10
11
8
9

FIG 1

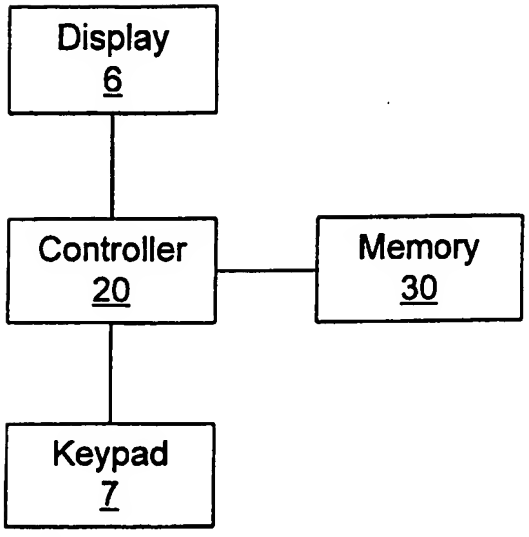
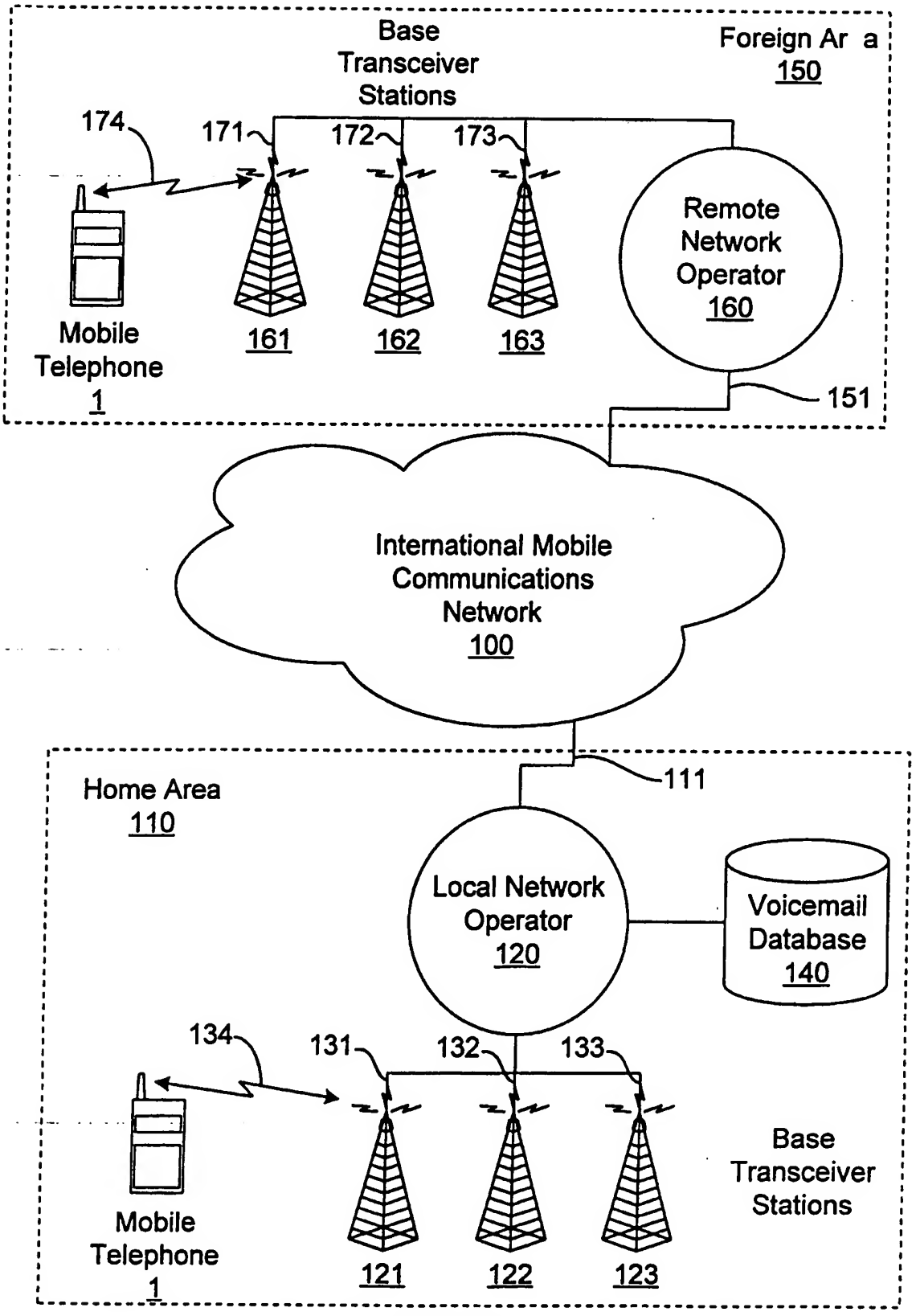

Display
6
Controller
20
Memory
30
Keypad
7

FIG 2


Base
Transceiver
Stations
Foreign Ar a
150
174
171
172
173
Remote
Network
Operator
160
Mobile
Telephone
1
161
162
163
151
International Mobile
Communications
Network
100
Home Area
110
111
Local Network
Operator
120
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Stations
Mobile
Telephone
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121
122
123

FIG 3

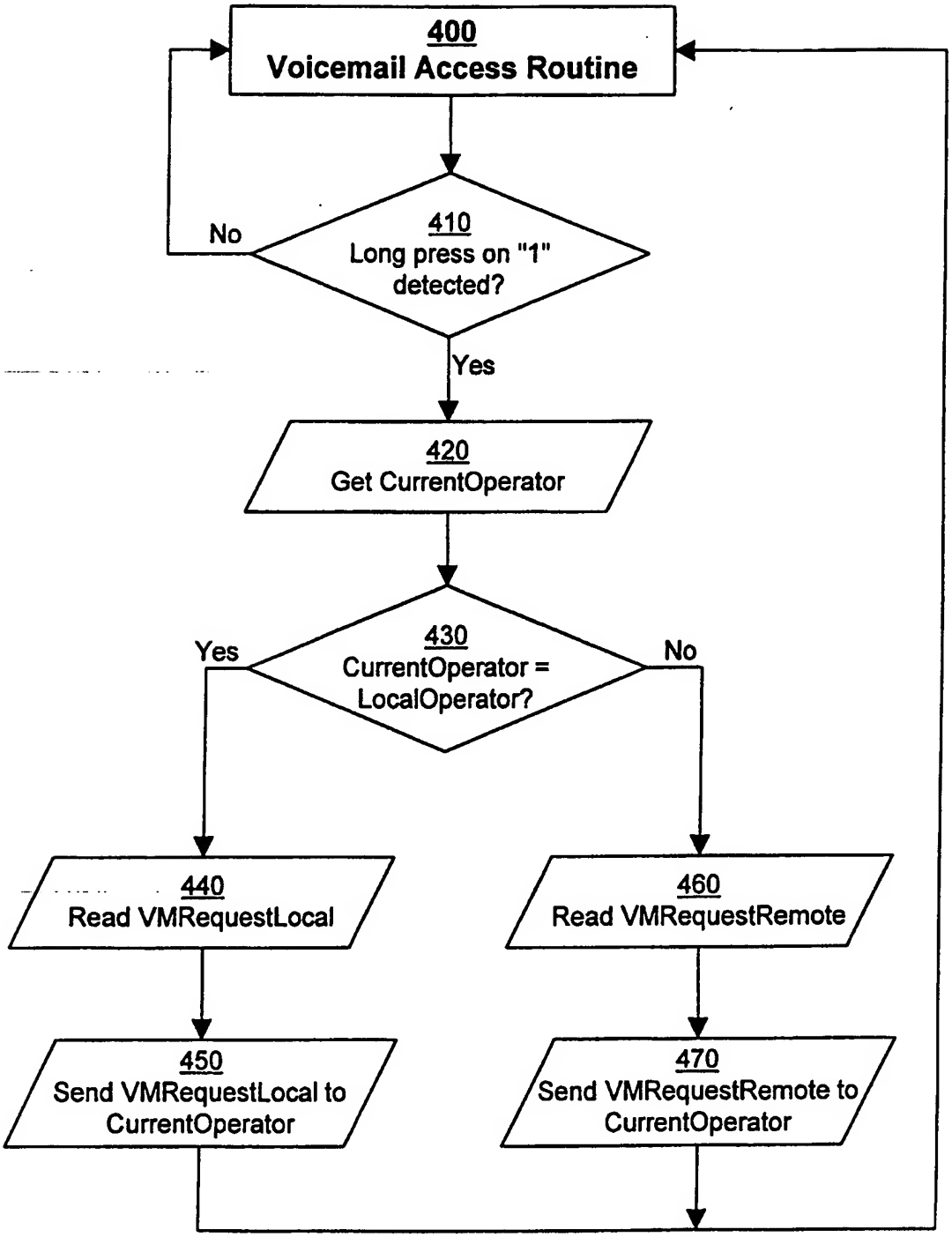
400
Voicemail Access Routine
410
Long press on "1" detected?
No
Yes
420
Get CurrentOperator
430
CurrentOperator = LocalOperator?
Yes
No
440
Read VMRequestLocal
450
Send VMRequestLocal to CurrentOperator
460
Read VMRequestRemote
470
Send VMRequestRemote to CurrentOperator

FIG 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 00/01187

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04M 1/652, H04M 1/274
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9711546 A1 (ERICSSON INC.), 27 March 1997 (27.03.97), page 10, line 15 - page 12, line 4, abstract --	1-12
A	EP 0526832 A2 (NEC CORPORATION), 10 February 1993 (10.02.93), figures 6,7, abstract --	1-12
A	EP 0530010 A2 (NOKIA MOBILE PHONES LTD.), 3 March 1993 (03.03.93), figure 1, abstract --	1-12
A	WO 9422260 A1 (MOTOROLA INC.), 29 Sept 1994 (29.09.94), figures 8,10, abstract --	1-12

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
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"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 October 2000	06 -11- 2000
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer David Forneheim/MN Telephone No. +46 8 782 25 00

INTERNATIONAL SEARCH REPORT

International application No.
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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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P,X	WO 0005858 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 3 February 2000 (03.02.00), page 3, line 6 - line 16; page 5, line 18 - page 7, line 21, figure 2, abstract	1-12
P,X	WO 0014992 A1 (TELEFONAKTIEBOLAGET LM ERICSSON), 16 March 2000 (16.03.00), page 3, line 6 - page 5, line 17, figure 1, abstract	1-12
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Information on patent family members

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				BR	9709434	A	10/08/99
				CA	2257632	A	11/12/97
				CN	1231107	A	06/10/99
				EP	0903050	A	24/03/99
				WO	9747151	A	11/12/97